

WHAT IS CLAIMED IS:

1. A system for cleaning a surface and/or restoring
the slip resistance of a surface, the surface having soils
5 and surface particles, the system comprising:

a) compressor means for supplying an air
stream, said compressor means being adjustable to a
desired level of air pressure, said compressor means
being in fluid communication with an air supply
10 conduit;

b) moisture reduction means in association with
the air stream;

c) entrainment means for entraining media
particulates into the air stream, said entrainment
15 means being adjustable so that the amount of media
particulates entrained can be varied;

d) media chamber means for storing the media
particulates before entrainment in the air stream;

e) restoration means for impinging the media
20 particulates upon the surface to remove soils and
surface particles, said restoration means being
movable across the surface in any direction, said
restoration means being in fluid communication with an
exhaust conduit, wherein said restoration means
25 comprises:

i) a support frame including a plurality of wheels;

ii) a nozzle having a longitudinal bore, one end of which is proximate the surface; and

5 iii) an exhaust chamber in fluid communication with said bore and with said exhaust conduit;

f) vacuum means in fluid communication with said exhaust conduit for the evacuation of
10 substantially all of the soils and surface particles from the surface, wherein said vacuum means automatically adjusts to said level of said air stream of said compressor;

g) classifier means for separating a portion of
15 the media particulates from the soils and surface particles, said classifier means being in fluid communication with said exhaust conduit;

h) automatic transfer means for transferring heavy media particulates from said classifier means to
20 said media chamber means; and

i) filter means for filtering the soils and surface particles, said filter means being in fluid communication with said classifier means,

wherein said system etches the surface and increases the
25 coefficient of friction of the surface.

2. The system of claim 1, wherein said transfer means includes a valve which automatically opens when said cleaning system is inactivated so as to permit the particulates to enter said media chamber means by gravity,
5 wherein said classifier means is positioned above said media chamber means.

3. The system of claim 1, further comprising a truck having a power takeoff shaft, wherein said compressor means
10 is powered by said truck takeoff shaft.

4. The system of claim 3, wherein said filter means comprises a dust collector.

15 5. The system of claim 4, wherein said dust collector includes pulse jet cleaning means.

6. The system of claim 1, further comprising a drying chamber which contains a desiccant means, at least a
20 portion of said air stream being in fluid communication with said drying chamber.

7. The system of claim 3, wherein said vacuum means is powered by said truck takeoff shaft.

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8. The system of claim 1, wherein the media particulates are selected according to the material from which the surface is made.

5 9. The system of claim 1, wherein the media particulates comprise garnet.

10. The system of claim 1, wherein the media particulates are approximately 0.1 to 0.8 mm in size.

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11. The system of claim 1, wherein the surface is a floor.

12. The system of claim 1, wherein said classifier
15 means includes a plurality of dispersion bars.

13. The system of claim 12, wherein a longitudinal axis of said inlet conduit of said classifier is approximately 120 degrees from a longitudinal axis of said
20 exhaust conduit.

14. The system of claim 12, wherein a terminal end of said inlet conduit of said classifier includes a deflection plate.

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15. The system of claim 1, wherein said abrasion means includes a control panel for controlling operation of said system.

5 16. The system of claim 15, wherein said control panel includes adjustment means for varying the amount of particulates entrained in said air stream.

17. The system of claim 15, wherein said control
10 panel includes particulate transfer means for automatically transferring the media particulates from a media hopper to said media chamber means.

18. A system of cleaning a floor and restoring the
15 slip resistance of a floor by means of media particulates, the floor being made of relatively soft and hard components, the floor having soils and surface particles thereon, the system comprising:

20 a) a compressor for supplying an adjustable air supply to an air conduit;

25 b) a pressure tank for containing a media storage means and for entraining an effective amount of the media particulates into the air supply, said media particulates being made of garnet, wherein said media particulates impinge upon the floor to dislodge

the soils and surface particles and to remove soft components of the tile;

5 c) moisture reduction means associated with said pressure tank, said moisture reduction means including a deliquescent;

d) a portable cleaning head movable on the floor in any direction, said cleaning head including:

i) a support frame including a plurality of wheels, said support frame including a handle;

10 ii) a nozzle which is in fluid communication with said air conduit;

iii) a wear tube releasably attached to a lower end of said nozzle;

15 iv) an exhaust chamber proximate said nozzle, said exhaust chamber being in fluid communication with an exhaust conduit;

e) vacuum means in fluid communication with said exhaust conduit for the evacuation of substantially all of the soils and surface particles from the floor;

20 f) classifier means for separating the media particulates from the soils and surface particles, said classifier means being located above said pressure tank, said classifier means including an inlet conduit having a plurality of dispersion bars;

25 and

g) dust collector means for filtering soils and surface particles, said dust collector means being in fluid communication with said classifier means.

5 19. The system of claim 18, further comprising a truck having a power takeoff shaft, wherein said compressor means is powered by said truck takeoff shaft.

20. The system of claim 18, where said dust collector
10 includes pulse jet cleaning means.

21. The system of claim 18, wherein said dust collector includes a cyclonic filter.

15 22. The system of claim 19, wherein said vacuum is powered by said truck takeoff shaft.

23. The system of claim 18, wherein the media particulates are approximately 0.1 to 0.8 mm in size.

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24. The system of claim 18, wherein an axis of said inlet conduit of said classifier is approximately 120 degrees from an axis of said exhaust conduit.

25. The system of claim 18, wherein one end of said inlet conduit of said classifier includes a deflection plate.

5 26. The system of claim 18, further comprising an automatic media transfer means for transporting the media from a storage hopper to said pressure tank.

27. The system of claim 18, further comprising a
10 classifier transfer means for transferring the heavy particulates from said classifier means to said media storage means of said pressure tank, said classifier transfer means comprising a plunger valve means within said pressure tank, having an upper, closed position and a
15 lower, open position, said plunger valve means permitting transfer of the media particulates by gravity when in said open position.

28. The system of claim 27, wherein said classifier
20 transfer means is electrically interconnected to a switch on said cleaning head, such that said classifier transfer means automatically permits transfer of media particulates when said cleaning head is switched to an "off" position.

25 29. A method of cleaning and restoring a hard surface, comprising the steps of:

a) positioning a vehicle proximate a site of the hard surface, said vehicle containing the components of a restoration system, including a vacuum means, a compressor, a pressure tank for containing particulate media, a classifier and a dust collector;

b) removing a cleaning machine from the vehicle and positioning said machine upon the surface, said machine being operatively connected to an air supply conduit and to an exhaust conduit;

c) turning on said cleaning machine;

d) entraining the particulate media into an air stream from a compressor;

e) adjusting the amount of said particulate media which is entrained into said air stream; and

f) making repeated passes of said cleaning machine over the surface, wherein soils and surface particles are removed by impingement of the particulate media on the hard surface.

30. The method of claim 29, further comprising the step of transferring the particulate media from said classifier to said pressure tank.

31. The method of claim 29, further comprising the step of engaging the power takeoff shaft of the vehicle so as to power said vacuum means and said compressor.

32. The method of claim 29, further comprising the step of adjusting the pressure under which the media is impinged on the hard surface.

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33. The method of claim 29, further comprising the step of recycling a portion of the particulate media.

34. The method of claim 33, further comprising the
10 step of adjusting the proportion of particulate media which is to be recycled.

35. The method of claim 29, further comprising the step of automatically transferring the particulate media
15 from a truck bed storage tank to a storage reservoir in said pressure tank.

36. A tile floor surface having a surface composition comprising about 50-66 wt% silicon and about 17-25 wt%
20 aluminum.

37. A tile floor surface which, after treatment with the restoration system of claim 29, has a surface composition comprising about 50-66 wt% silicon and about
25 17-25% aluminum.

38. The tile floor surface of claim 36, wherein the tile is quarry tile.

39. The tile floor surface of claim 38 which has a coefficient of friction of about 0.8-1.0 when clean and dry.

40. The tile floor surface of claim 38 which has a coefficient of friction of about 0.9-1.0 when clean and dry.

41. The tile floor surface of claim 38 which has a coefficient of friction of about 0.5-0.6 when wet.

42. The tile floor surface of claim 38 which has a coefficient of friction of about 0.3-0.5 when soiled and wet.

43. A tile floor surface wherein after treatment with the restoration system of claim 29 the elemental composition of the tile surface is substantially the same as the elemental composition of the core of the tile.

44. A tile floor surface which, after treatment with the restoration system of claim 29, has a coefficient of

friction at least as high as a coefficient of friction of a new tile floor surface.